Claims

What is claimed is:

1. An optical integrated circuit, comprising:

at least one waveguide extending axially through at least a portion of a base along an optical path; and

a polarization swapping portion formed in a portion of the at least one waveguide using polarized light.

2. The optical integrated circuit of claim 1, wherein the polarization swapping portion of the at least one waveguide is polarized at an angle of about 42 degrees or more and about 48 degrees or less with respect to axes perpendicular to the axis of the optical path.

3. The optical integrated circuit of claim 1, wherein the polarized light comprises at least one of femto-second pulsed visible light and UV light.

4. The optical integrated circuit of claim 1, wherein the polarization swapping portion is formed in the portion of the at least one waveguide using polarized light from a laser.

5. The optical integrated circuit of claim 4, wherein the at least one waveguide has a first index of refraction and the polarization swapping portion has a second index of refraction different from the first index of refraction.

6. The optical integrated circuit of claim 4, wherein the polarization swapping portion acts as a half-waveplate.

7. The optical integrated circuit of claim 6, wherein the polarization swapping portion of the at least one waveguide is polarized at

an angle of about 45 degrees with respect to axes perpendicular to the axis of the optical path.

8. The optical integrated circuit of claim 4 wherein the polarization swapping portion of the at least one waveguide is polarized at an angle of around 45 degrees with respect to axes perpendicular to the axis of the optical path.

9. A method of fabricating an optical integrated circuit, comprising:

providing a base;

forming at least one waveguide extending axially through at least a portion of the base along an optical path; and

forming a polarization swapping portion in a portion of the at least one waveguide using polarized light.

10. The method of claim 9, wherein forming the polarization swapping portion comprises providing polarized light to the at least one waveguide at an angle of about 45 degrees with respect to axes perpendicular to the axis of the optical path.

11. The method of claim 9, wherein the polarized light comprises at least one of femto-second pulsed visible light and UV light.

12. The method of claim 9, wherein forming the polarization swapping portion comprises providing polarized light to the at least one waveguide from a laser.

13. The method of claim 12, wherein forming the polarization swapping portion comprises providing polarized light to the at least one

waveguide at an angle of about 45 degrees with respect to axes perpendicular to the axis of the optical path.

14. The method of claim 13, wherein the polarized light comprises at least one of femto-second pulsed visible light and UV light.

15. The method of claim 12, wherein the polarized light comprises at least one of femto-second pulsed visible light and UV light.

16. The method of claim 9, wherein forming the polarization portion comprises providing the polarized light from a laser to the at least one waveguide using a prism.

17. A method of mitigating polarization dependence in an optical integrated circuit, comprising:

providing an optical integrated circuit having at least one waveguide extending axially through at least a portion of a base along an optical path; and

forming a polarization swapping portion in a portion of the at least one waveguide using polarized light.

18. The method of claim 17, wherein forming the polarization swapping portion comprises providing polarized light to the at least one waveguide at an angle of about 45 degrees with respect to axes perpendicular to the axis of the optical path.

19. The method of claim 17, wherein the polarized light comprises at least one of femto-second pulsed visible light and UV light.

20. The method of claim 17, wherein forming the polarization swapping portion comprises providing polarized light to the at least one waveguide from a laser.

21. The method of claim 20, wherein forming the polarization swapping portion comprises providing polarized light to the at least one waveguide at an angle of about 45 degrees with respect to axes perpendicular to the axis of the optical path.

22. The method of claim 21, wherein the polarized light comprises at least one of femto-second pulsed visible light and UV light.

23. The method of claim 20, wherein forming the polarization swapping portion comprises providing polarized light to the at least one waveguide at an angle of about 42 degrees or more and about 48 degrees or less with respect to axes perpendicular to the axis of the optical path.